

# “COMPLEX FLOWS AND COMPLEX FLUIDS 2025”

Satellite Meeting StatPhys29

8-11 July 2025

Aula Marconi (CNR) - Piazzale Aldo Moro,7 - 00185, Rome (ITALY)



## WORKSHOP PROGRAM

MEETING ROOM: Sala MARCONI

COFFEE BREAKS: Sala LAGUNA

# Tuesday 8

## MORNING SESSION

**8.30 - 9.45 Registration and welcome coffee (SALA LAGUNA)**

**9.45 - 10.30 Invited: Antonio Celani “Learning to navigate in complex flows”**

**10.30 - 12.30 (8)**

1. Qiu “Smart navigation of a gravity-driven glider with adjustable centre-of-mass”
2. Gustavsson “Efficient microswimmer navigation”
3. Calascibetta “Harnessing swarms to optimize transport of interacting active particles”
4. Paul “Experimental Realization of Autonomous Navigation of Active Microswimmer in Complex Flow Fields using Reinforcement Learning “
5. Wan “Phase transitions of active tracer particles in two-dimensional isotropic turbulence”
6. De Wit “Learning a dynamical system for Lagrangian particle trajectories using the Mori-Zwanzig formalism”
7. Aluie “The Multiscale Ocean Circulation”
8. Buzzicotti “Generation and Reconstruction of Lagrangian Turbulence with Stochastic Generative Models”

**12.30 - 14.00 LUNCH**

## AFTERNOON SESSION

**14.00 - 14.45 Invited: Eva Kanso “Order and Chaos in Massive Schools of Fish”**

**14.45 - 16.00 (5)**

1. Rosti “Turbulence in a fluid with variable viscosity”
2. Pelusi “Intermittency, dynamical regimes and role of emulsifiers in emulsions under Rayleigh-Bénard thermal convection”
3. Guastella “Directional Fluidity induced by Asymmetric Wall Roughness”
4. Perlekar “Scale-by-scale energy transfers in bubbly flows”
5. Gallo “Fluctuating hydrodynamics description of phase change in fluids”

**16.00 - 16.30 COFFEE BREAK**

**16.30 - 17.15 Invited: Cristina Marchetti “Active Phase Separation and Interfaces”**

# Wednesday 9

## MORNING SESSION

**9.00 - 9.45 Invited:** Agnese Seminara “Octopus inspired multi-agent prediction and navigation in a turbulent environment”

### 9.45 - 10.30 (3)

1. Rigolli “Natural olfactory scene statistics in a model of turbulent odor dispersion”
2. Shukla “Collective Nutrient Search by Active Chemotactic Agents in Two Dimensional Flows “
3. Piro “Policy heterogeneity improves collective olfactory search in 3-D turbulence”

### 10.30 - 11.00 COFFEE BREAK

### 11.00 - 12.30 (6)

1. Casciola “Supramolecular Polymers for Turbulent Drag Reduction”
2. Steinberg “Stochastic resonance in low-inertia viscoelastic channel flow”
3. Zhang “Global drag reduction and local flow statistics in Taylor-Couette turbulence with dilute polymer additives”
4. Berti “Nonhomogeneous elastic turbulence in two-dimensional confined geometry”
5. Garg “Examining the dissipation range of polymeric turbulence”
6. Linkman “Subcritical transition to elastic turbulence in parallel shear flows: Recent progress”

### 12.30 - 14.00 LUNCH

## AFTERNOON SESSION

**14.00 - 14.45 Invited:** Aurore Naso “Settling and collisions of ice crystals in turbulent clouds”

### 14.45 - 16.00 (5)

1. Bec “Homogeneous turbophoresis of heavy particles”
2. Mehlig “Inertia induces strong orientation fluctuations of non-spherical atmospheric particles”
3. Reynolds “On the stability of a collection of sedimenting spheres”
4. Cialesi-Esposito “How small droplets form in turbulent multiphase flows”
5. Toschi “Stochastic resonance of magnetic particles in turbulence”

### 16.00 - 16.30 COFFEE BREAK

### 16.30 - 17.15 POSTER SESSION

**20.00 SOCIAL DINNER** at [CAST-CINE BISTROT](#) ([Largo Marcello Mastroianni, 1 Roma](#))

# Thursday 10

## MORNING SESSION

### 9.00 - 10.30 (6)

1. Soldati "Complex interface dynamics in drop-laden turbulence"
2. Foggi-Rota "Interface dynamics of a turbulent water layer"
3. Abdelaziz "Matching small and large scales in weakly-porous grid flows"
4. Magacho "Hidden symmetry in 3D turbulence: Navier-Stokes vs Smagorinsky"
5. Corbetta "Enhancing lattice kinetic schemes for fluid dynamics with Lattice-Equivariant Neural Networks"
6. Lopez "Turbulent Boundary Layer on Logarithmic Lattices"

### 10.30 - 11.00 COFFEE BREAK

### 11.00 - 12.30 (6)

1. Carenza "Rheology of a Chiral Active System"
2. Tiribocchi "Shapes and dynamic regimes of an active fluid droplet under confinement"
3. Caprini "Hydrodynamics of odd-interacting systems"
4. Cecconi "Beating Dynamics of Flagella Under Traveling-Wave Perturbations"
5. Gupta "Unveiling the Spatial Organization of Vortices in Active Turbulence"
6. Ventrella "Collective dynamics of simple model microswimmers"

### 12.30 - 14.00 LUNCH

## AFTERNOON SESSION

**14.00 - 14.45 Invited:** Davide Marenduzzo "Topological quasiparticles in active turbulence"

### 14.45 - 16.00 POSTER SESSION

### 16.00 - 16.30 COFFEE BREAK

**16.30 - 17.15 Invited:** William Irvine "Weaving tangled vortex webs"

# FRIDAY 11

## MORNING SESSION

**9.00 - 9.45 Invited:** Michael Wilczek “Emulating high-Reynolds-number flows with ensembles of lower-Reynolds-number flows”

### 9.45 - 10.30 (3)

1. Bouchet “Emulators of turbulent flows, atmosphere dynamics and extreme events”
2. Benavides “Triad phase dynamics determine flux in 2D turbulence”
3. Bustamante “Helical Triad Phase Synchronisation in Extreme 3D Navier-Stokes Flows”

### 10.30 - 11.00 COFFEE BREAK

### 11.00 - 12.30 (6)

1. Lubke “Coherent magnetic structures in various MHD turbulence systems and their impact on cosmic ray transport”
2. Onorato “Evidence of resonant interactions in ocean wave data”
3. Mordant “Stratified turbulence forced by large scale internal waves: experiments in the Coriolis facility”
4. Rosenhaus “Weak and strong turbulence in self-focusing and defocusing media”
5. Shavit “Weak turbulence of internal gravity waves”
6. Valadao “Scaling and Predictability in Surface Quasi-Geostrophic Turbulence”

### 12.30 - 14.00 LUNCH

## AFTERNOON SESSION

**14.00 - 14.45 Invited:** Samriddhi Sankar Ray “Solving problems in hydrodynamic turbulence by leaning on ideas from many-body systems”

### 14.45 - 16.00 (5)

1. Chertkov “Control of Small Spontaneous Turbulence Using Generative AI”
2. Huysmans, “Non-Uniqueness and Inadmissibility of the Vanishing Viscosity Limit of the Passive Scalar Transport Equation”
3. Kumar-Babu “Liquid-Droplet Coalescence: CNN-based Reconstruction of Flow Fields from Concentration Fields”
4. Cremades-Botella “Classically studied coherent structures only paint a partial picture of wall-bounded turbulence”
5. Xue “Discovery of intrinsic dynamics from kinetic data”

### 16.00 - 16.30 COFFEE BREAK

### 16.30 - 16.45 EPL PRIZE

**16.45 - 17.30 Invited:** Chao Sun “Experimental Investigation of Flowing Emulsions in Wall-Bounded Turbulence”